REMARKS

Status Summary

With this amendment, claims 1-4, 6-15, 17, and 19-34 are pending in the present application. Claims 5, 16, and 18 have been canceled. Claims 1, 10, 12, 19, 24, 28, 30 and 31 have been amended. Support for the amendments can be found throughout the specification and drawings.

Interview Summary

Applicant conducted a telephonic interview with Examiner Kimberly Thornewell on June 26, 2007. Participating in the telephonic interview was applicant's attorney, David M. Sigmon. Applicant sincerely appreciates the time and consideration of Examiner Thornewell in agreeing to and participating in the telephonic interview. In the interview, the rejections of the claims under 35 U.S.C. § 101 based on non-statutory subject matter were discussed. It is applicant's understanding that no agreement was reached between the applicant and Examiner Thornewell during the telephonic interview. Applicant respectfully submits that the amendments and remarks presented herein are believed to be consistent with and also summarize the positions presented by the parties during the telephonic interview.

Claim Objections

Claims 10, 16, 19, and 32 are objection to by the Examiner for various informalities. Applicant submits that the claims as amended overcome the objections.

Claim Rejections - 35 U.S.C. § 112

Claims 5, 16, 18, 28, 30, and 31 stand reject under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which the applicant regards as the invention.

Applicant respectfully submits that the rejections under 35 U.S.C. § 112, second paragraph, have been addressed above in the amended claims. Claims 5, 16, and 18 have been canceled, claims 28, 30, and 31 have amended to overcome the rejections stated in the Official Action.

Claim Rejections - 35 U.S.C. § 101

Claims 1-31 and 33-34 stand reject under 35 U.S.C. § 101 as being directed to non-statutory subject matter. In particular, the examiner asserted that the claims fail to meet the tangible results requirement.

Applicant respectfully submits that original independent claims 1, 12, 19, 24 and 28 each specifically stated a tangible result of determining a property of a structure which one of ordinary skill in the art recognizes and can use to determine meaningful parameters of the measured structure. Each of the claims recite determining a property of a structure including at least one property relating to: (1) a fiber orientation distribution (ODF) of the fibers on the surface of the imaged structure; (2) basis weight non-uniformity (blotchiness) of the structure; (3) pilling on the surface of the structure; or (4) texture function of the structure. As explained in State Street Bank & Trust Co. v. Signature Financial Group, Inc., 149 F.3d 1368, 47

U.S.P.Q.2d 1596 (Fed. Cir. 1998), certain types of mathematical subject matter, standing alone, represent nothing more than abstract ideas until reduced to some type of practical application, i.e., "a useful, concrete and tangible result." (See, State Street Bank & Trust Co. v. Signature Financial Group, Inc., 149 F.3d 1368, 47 U.S.P.Q.2d 1596 (Fed. Cir. 998), citing In re Alappat, 33 F.3d 1526, 31 USPQ2d1545, 1554 (Fed. Cir. 1994) (en banc).) Each one of the above listed structural properties has a practical application and is thus a useful, concrete and tangible result.

Independent Claim 1 clearly states a tangible result of determining a property of the structure selected from the group consisting of: (1) a fiber orientation distribution (ODF) of the fibers on the surface of the imaged structure; (2) basis weight non-uniformity (blotchiness) of the structure; (3) pilling on the surface of the structure; and (4) texture function of the structure.

Fiber orientation distribution (ODF) is explained from pages 7-13 of the specification of the present application and fabrics with associated fiber orientation distribution (ODF) from 1 to -1 are shown in Figures 5A-5E. Fiber orientation distribution (ODF) is a common measurement use by people of ordinary skill in the textile art to determine the structural integrity and usefulness of certain nonwoven fabrics and structures. As explained, if the fiber orientation distribution (ODF) measurement is 1, then such measurement indicates that the fibers in the nonwoven are oriented parallel in one direction. If the fiber orientation distribution (ODF) measurement is -1, then such measurement indicates that the fibers in the nonwoven

are oriented perpendicular to that one direction. If the fiber orientation distribution (ODF) measurement is 0, then such measurement indicates that the fibers in the nonwoven are randomly assembled. Any number between 1 and -1 tells an operator that the fabric has fibers oriented somewhere between parallel and perpendicular with numbers closer to 1 being closer to parallel and numbers closer to -1 closer to perpendicular. Such a measurement is a useful, concrete, and tangible result.

Similarly, basis weight non-uniformity (blotchiness) of the structure has historically been used as an index of uniformity in nonwovens as explained in the specification of the present application on pages 13-20 and in the Figures 8-12. Uniformity of basis weight over a specified area of measurement not only tells a person of ordinary skill in the art about the functionality of the nonwoven fabric or structure, but, as described in the specification, can also provide information about the appearance of the structure. For example, the uniformity index can be used for both assessing functionality and appearance of a nonwoven structure. Such a measurement provides a useful, concrete, and tangible result that can be used by someone of ordinary skill in the art.

Pilling on the surface of a nonwoven structure or other fabric can result in a non-uniform appearance of the structure. Thus, quantifying the pilling of the surface of a structure can be a useful tool for one of ordinary skill in the art. As explained in the specification of the present application on pages 20-23 and in Figures 13A-18, measurement of pilling areas can provide details of individual pills and overall non-uniformity of the texture brought about by pilling and can be automatically measured

against current ASTM standards for pilling. Again, such measurements provide useful, concrete, and tangible results that can be used by someone of ordinary skill in the art.

Further, the texture function of the structure is a recognized function used by persons of ordinary skill in the textile art to assess the uniformity of a nonwoven structure. The texture function as determined through texture periodicity and corresponding amplitude, for example, can provide valuable information that can be used by one of ordinary skill in the art to assess uniformity of the structure being analyzed as explained on pages 23-26 and in Figures 19A-24 of the present application. These measurements further contain useful, concrete and tangible results that can be used by someone of ordinary skill in the art.

Independent claim 12 states a tangible result of computer processing of the digitized image including use of at least one algorithm selected from the group comprising: Fourier transform; hough transform; direct tracking; ridge tracking; edge tracking and flow filed analysis to create a fiber orientation distribution (ODF) of the fibers on the surface of the imaged fibrous structure. As explained above, fiber orientation distribution (ODF) is a useful, concrete, and tangible result that is used by one of ordinary skill in the textile art to assess the functionally and appearance of a nonwoven structure.

Independent claim 19 states a tangible result of computer processing of the digitized image including breaking the digitized image into windows of at least 1 cm x 1 cm for analysis of size effect in order to determine basis weight non-uniformity

(blotchiness) of the fibrous structure. As explained above, basis weight non-uniformity (blotchiness) of the fibrous structure is a useful, concrete, and tangible result that is used by one of ordinary skill in the textile art to assess the functionally and appearance of a nonwoven structure.

Independent claim 24 states a tangible result of computer processing of the digitized image to determine pilling on the surface of the structure. As explained above, determined pilling on the surface of the structure is a useful, concrete, and tangible result that is used by one of ordinary skill in the textile art to assess the functionally and appearance of a nonwoven structure.

Independent claim 28 states a tangible result of computer processing of the digitized image including use of an algorithm to determine texture periodicity and corresponding amplitude to determine the texture function. As explained above, a texture function of the structure based on the determined texture periodicity and corresponding amplitude is a useful, concrete, and tangible result that is used by one of ordinary skill in the textile art to assess the functionally and appearance of a nonwoven structure.

Since claims 2-4 and 6-11 depend from claim 1, claims 13-17 depend from claim 12, claims 20-23 depend claim 19, claims 25-27 depend from claim 24 and claims 29-31 and 33-34 depend from claim 28, applicant respectfully submits that each of the claims meet the requirements set forth in 35 U.S.C. § 101. Therefore, applicant respectfully submits that these claims are directed toward statutory subject matter which provides a tangible result.

Claim Rejections - 35 U.S.C. § 102

Claims 12-13, 15-16 and 18 stand rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 5,299,133 to Kobsa et al. (hereinafter "Kobsa"). Claims 19-20 and 22-23 stand rejected under 35 U.S.C. § 102(a) as being anticipated by the article entitled, "Area-Based Strategy for Determining Web Uniformity," Textile Research Journal, December 2002, by Pourdeyhimi, et al. (hereinafter, the "2002 Pourdeyhimi article"). Claims 24-27 stand rejection under 35 U.S.C. § 102(b) as being anticipated by the article "Characterizing Fuzz in Non-woven Fabrics," IMJ Spring 2000 by Kim et al. (hereinafter, the "Kim article"). Claims 28-29 and 33-34 stand rejected under 35 U.S.C. § 102(b) as being anticipated by the article entitled, "Texture Evaluation of Carpets Using Image Analysis," Textile Research Journal, Vol. 61, 1991, by Wu et al. (hereinafter, the "Wu article").

Claim 12 recites a computer control method for evaluating selective surface and physical optical properties of the structures made wholly or partly from fibers, polymers, films or a combination thereof. Claim 12 recites illuminating the surface of a fibrous structure and obtaining a digitized image from the illuminated surface of the structure. Claim 12 also recites computer processing the digitized image including use of at least one algorithm selected from the group comprising Fourier transform, hough transform, direct tracking, rich tracking, edge tracking and flow filed analysis to create a fiber orientation distribution of the fibers on the surface of the imaged fibrous structure. Applicant respectfully submits that claim 12 is not anticipated by Kobsa

because Kobsa does not disclose each and every element claimed in claim 12. In particular, Kobsa does not disclose processing the digitized image to create a fiber orientation distribution of the fibers on the surface of the imaged fibrous structure.

Kobsa discloses a method for determining luster characteristics of fiber filaments utilizing a mathematical model of a filament cross-sectional shape and simulated impinging light to determine light distribution after interaction with the fiber and thereby determine luster properties. The method also includes a method for driving individual filament cross-sectional shapes of fibers in a bundle of touching filaments and deriving therefrom other fiber properties and controlling the manufacturing parameters affecting such properties as well as luster properties.

Applicant respectfully submits that determining luster properties in a cross-sectional shape of a single fiber is not the same as the fiber orientation distribution of fibers within a structure. Fiber orientation distribution (hereinafter, "ODF") has a specific meaning to one of ordinary skill in the art and as define within the specification of the current application which relates to properties of nonwovens based on the positioning of a plurality of fibers in the nonwoven structure.

As shown in Figures 5A-5E and discussed within the specification of the current application on pages 7-13, ODF relates to the geometrical orientation of the plurality of fibers within a nonwoven or paper structure which can be used to identify certain properties that the paper or nonwoven structure will exhibit. Such a measurement of the ODF of paper or nonwoven structure has nothing to do with the luster or cross-sectional shape of a single fiber which is being measured within

Kobsa. Kobsa does not disclose, teach or suggest any type of measurement which discusses fiber orientation of fibers within a fibrous structure. More particularly, Kobsa does not disclose, teach or suggest fiber orientation distribution of the fibers on the surface of an imaged structure. Therefore, applicant respectfully submits that Kobsa does not anticipate claim 12 or the claims that depend therefrom, including claims 13 and 15.

Claim 19 recites a computer control method for evaluating selected surface physical optical properties of structures made wholly or partly from fibers, polymers, films or any combination thereof. Claim 19 has been amended to recite illuminating the surface of fibrous structure in obtaining a digitized image from a structure sample size of at least 10 cm by 10 cm. Claim 19 further recites computer processing of the digitized image including breaking the digitized image into windows of at least 1 cm by 1 cm in analyzing the size effect to determine the basis weight non-uniformity of the fibrous structure. Applicant respectfully submits that claim 19 is not anticipated by the 2002 Pourdeyhimi article under 35 U.S.C. § 102(a).

The 2002 Pourdeyhimi article discloses real-time characterization of nonwovens as the nonwovens are being produced. The main author of this document is also the inventor of the present subject matter of the current application. Applicant have filed herewith as Exhibit A, a 35 U.S.C. § 131 Declaration stating that the present invention as claimed in claim 19 was invented by the inventor before the publication date of the 2002 Pourdeyhimi article. Therefore, applicant respectfully submits that the 2002 Pourdeyhimi article is not prior art to claim 19 or the claims that

depend therefrom within the present application. Therefore, applicant respectfully submits claims 19-20 and 22-23 are not anticipated by the 2002 Pourdeyhimi article.

Independent claim 24 recites a computer control method for evaluating selected surfaces and physical optical properties of structures made wholly or partly from fibers, polymers, films or a combination thereof. The method of claim 24 recites circularly illuminating surface of a fibrous structure having pilling thereon by transmitting the light at an acute angle between about 4º and 60º to the surface of the structure to provide dark field imaging of the surface structure wherein little light is reflected by the surface and significantly light is reflected by pills and surface defects thereon. Claim 24 also recites obtaining a digitized dark field image of the surface of the structure and computer processing of the digitized image to determine pilling on the surface of the structure. Applicant respectfully submits that claim 24 is not anticipated by the Kim article because the Kim article does not disclose each and every element claimed in claim 24.

The Kim article discloses using a cylindrical lighting to light the surface of a nonwoven fabric to isolate and measure the amount of fuzz contained on the surface of the nonwoven fabric. Images are taken and then converted to black and white by applying the relaxation threshold technique. To estimate the increased amount of fuzzing due to abrasion, the threshold value of the control sample can be adjusted such that the fuzz area is close to zero. (See, the Kim article, pages 19-20.)

The Kim article does not disclose dark field imaging to identify the existence of fuzz on a nonwoven fabric. Instead, the Kim article specifically discloses the

conversion of a photograph to a black and white image to create contrast. Conversely, dark field imaging is accomplished through using a software program to selectively darken the image to create a greater contrast than by just turning the photograph to black and white. Applicant respectfully submits that using dark-field imaging creates more accurate and better results in determining the amount of pilling and fuzz on surface of a fabric structure.

Since the Kim article does not disclose the use of dark field images, applicant respectfully submits that the Kim article does not anticipate claim 24 or the claims that depend therefrom, including claims 25-27.

Independent claim 28 recites a computer controlled method for evaluating selective surface and physical optical properties of structure made wholly or partly from fibers, polymers, films or a combination thereof. The method of claim 28 recites illuminating the surface of the fibrous structure by transmitting light at an acute angle thereto between about 10º and 80º in order to highlight raised features on the surface of the structure. Claim 28 also recites obtaining a digitized image of the structure of the surface and computer processing of the digitized image including use of an algorithm to determine texture, periodicity and corresponding amplitude to determine a texture function of the structure.

The Wu article describes image enhancement techniques for assessing tuft geometry and concomitant appearance changes in new and worn carpets. The publication discloses using image analysis of tufts to identify the size distribution of the tufts by taking an image through a video camera and analyzing the image. This

size distribution of a tuft is not a texture periodicity or a corresponding amplitude of a texture periodicity as used in clam 28 and used and defined within the specification of the present application. The Wu article does not disclose the determining of a texture function of the structure based on the determined texture periodicity and corresponding amplitude. Therefore, the Wu article does not anticipate claim 28 or the claims that depend therefrom including claims 29 and 33-34.

For at least the reasons listed above, claims 12-13, 15, 19-20, 22-29, and 33-34 are not anticipated by the cited references under 35 U.S.C. § 102(a) or (b). Therefore, Applicants respectfully request that these rejections be withdrawn at this time.

Claim Rejections - 35 U.S.C. § 103(a)

Claims 1-5, 7-11 and 17 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Kobsa in view of the Kim article. Claim 6 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Kobsa in view of the Kim article and further in view of the 2002 Pourdeyhimi article. Claim 14 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Kobsa in view of U.S. Patent No. 4,634,280 to Paulson, Jr. (hereinafter, "Paulson"). Claim 21 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over the 2002 Pourdeyhimi article in view of Paulson. Claim 30 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over the Wu article in view of the article entitled, "Assessing Fiber Orientation in Nonwoven Fabrics, " INDA Journal of Nonwoven Research, Vol. 5, No. 4, 1993 (hereinafter, the "1993 Pourdeyhimi article"). Claim 31 stands rejected under

35 U.S.C. § 103(a) as being unpatentable over the Wu article in view of the article entitled, "Evaluating Carpet Appearance Loss: Periodicity and Tuft Placement, "Textile Research Journal, 64(1), January 1994, by Pourdeyhimi, et al. (hereinafter, the "1994 Pourdeyhimi article").

Independent Claim 1 recites a computer control method for evaluating selective surface and physical optical properties of structures made wholly or partly from fibers, polymers, films or combination thereof. Claim 1 includes illuminating the surface of a structure and obtaining a digitized image from the illuminated surface of the structure. Claim 1 also recites computer processing of the digitized image to determine a property of structure selected from the group consisting of: (1) a fiber orientation distribution (ODF) of the fibers on the surface of the imaged structure; (2) basis weight non-uniformity (blotchiness) of the structure; (3) pilling on the surface of the structure; and (4) texture function of the structure.

Applicant respectfully submits that Kobsa in view of the Kim article does not disclose, teach or suggest all the features of independent claim 1. Kobsa only discloses the measurement of cross-sectional shapes of single individual fibers and determination of the fiber's luster properties. Kobsa does not disclose computer processing of the digitized image to determine a property of the structure such as a fiber orientation distribution of the fibers on the surface of the image structure, basis weight non-uniformity of the structure or the texture function of the structure. Therefore, even modifying the method from the Kim article for evaluating the fuzz on a nonwoven fabric the combination of the two references would not yield all the

features set forth in independent claim 1. Therefore, applicant respectfully submits that neither claim 1 nor the claims that depend therefrom including claims 2-4, and 7-11 are not rendered obvious by the cited references.

Similarly, claim 17 is not rendered obvious by Kobsa in view of the Kim article. Applicant submits that Kobsa and the Kim article do not disclose, teach, or suggest all the features of claim 12. The Kim article does not overcome the significant shortcomings of Kobsa. Claim 17 depends from claim 12. Therefore, Kobsa and the Kim article, either alone or in combination, do not render obvious claim 17.

Further, claim 6 stands rejected as being unpatenable over Kobsa in view of the Kim article and further in view of the 2002 Pourdeyhimi article, while claim 21 stands rejected as being unpatentable over the 2002 Pourdeyhimi article in view of Paulson. Applicant submits that the 2002 Pourdeyhimi article is removed as citable prior art base on the Declaration under Rule 1.131 submitted herewith. Thus, the rejections of claims 6 and 21 should be withdrawn.

Claim 14 is not rendered obvious by Kobsa in view of Paulson. Applicant submits that Kobsa and Paulson do not disclose, teach, or suggest all the features of claim 12. Paulson does not overcome the significant shortcomings of Kobsa. Claim 14 depends from claim 12. Therefore, Kobsa and Paulson, either alone or in combination, do not render obvious claim 14.

Claim 30 is not rendered obvious by the Wu article in view of the 1993 Pourdeyhimi article. Applicant submits that the Wu article and the 1993 Pourdeyhimi article do not disclose, teach, or suggest all the features of claim 28. The 1993

Pourdeyhimi article does not overcome the significant shortcomings of the Wu article. Claim 30 depends from claim 28. Therefore, the Wu article and the 1993 Pourdeyhimi article, either alone or in combination, do not render obvious claim 30.

Claim 31 is not rendered obvious by the Wu article in view of the 1994 Pourdeyhimi article. Applicant submits that the Wu article and the 1994 Pourdeyhimi article do not disclose, teach, or suggest all the features of claim 28. The 1994 Pourdeyhimi article does not overcome the significant shortcomings of the Wu article. Claim 31 depends from claim 28. Therefore, the Wu article and the 1994 Pourdeyhimi article, either alone or in combination, do not render obvious claim 31.

For at least the reasons listed above, claims 1-11, 14, 17, 21, and 30-31 are not rendered obvious by the cited references under 35 U.S.C. § 103(a). Therefore, Applicants respectfully request that these rejections be withdrawn at this time.

CONCLUSION

In light of the above amendments and remarks, it is respectfully submitted that the present application is now in proper condition for allowance, and an early notice to such effect is earnestly solicited.

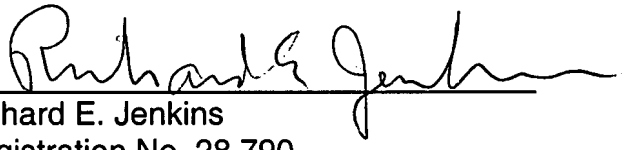
If any small matter should remain outstanding after the Patent Examiner has had an opportunity to review the above Remarks, the Patent Examiner is respectfully requested to telephone the undersigned patent attorney in order to resolve these matters and avoid the issuance of another Official Action.

DEPOSIT ACCOUNT

The Commissioner is hereby authorized to charge any fees associated with the filing of this correspondence to Deposit Account No. **50-0426**.

Respectfully submitted,

JENKINS, WILSON, TAYLOR & HUNT, P.A.

Date: August 8, 2007 By: 

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PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of: Pourdeyhimi

Group Art Unit: 2128

Serial No.: 10/612,790

Examiner: Thornewell, Kimberly A.

Filed: July 2, 2003

Docket No. 297/180

Confirmation No.: 5458

For: OPTICAL METHOD FOR EVALUATING SURFACE AND PHYSICAL PROPERTIES OF STRUCTURES MADE WHOLLY OR PARTIALLY FROM FIBERS, FILMS, POLYMERS OR A COMBINATION THEREOF

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DECLARATION PURSUANT TO 37 C.F.R. § 1.131

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

1. I, Dr. Behnam Pourdeyhimi, am the inventor of the subject matter disclosed and claimed in the subject above captioned U.S. Patent Application Serial No. 10/612,790.

Serial No.: 10/364,949

2. I have had the opportunity to review the Official Action mailed on April 9, 2007 from the U.S. Patent and Trademark Office for the above-referenced U.S. patent application.

3. I have also reviewed the following document cited by the United States Patent and Trademark Office in the Official Action mailed on April 7, 2007: "Area-Based Strategy for Determining Web Uniformity, " Textile Research Journal, December 2002, by Pourdeyhimi, et al. (hereinafter, the "2002 Pourdeyhimi article").

4. The subject matter embodied in claims 6 and 19-23 of the subject U.S. patent application was invented prior to the publication date of the 2002 Pourdeyhimi article.

5. 2002 Pourdeyhimi article is a publication that was co-authored by the inventor, Mr. Pourdeyhimi.

I hereby declare that all statements herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under §1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Date: Aug 7, 07 By: B. Pourdeyhimi

Dr. Behnam Pourdeyhimi